Minnesota Plant Press

The Minnesota Native Plant Society Newsletter

www.mnnps.org

Volume 36 Numbers 1&2 **Summer-Fall 2017**

Minnesota Native Plant Society
A non-profit organization dedicated to the conservation and appreciation of Minnesota's native plants and plant communities through education and public awareness.

Monthly meetings

Thompson Park Center/Dakota Lodge
Thompson County Park
1200 Stassen Lane
West St. Paul, MN 55118

First Thursday of the month, October-December & February-June. Social period begins at 6:30 p.m. and the meeting runs from 7-9 p.m. Please check the website at www.mnnps.org for more program information.

Membership

The MNNPS membership year starts January 1st. Dues may be paid at the February meeting or mailed to:

Minnesota Native Plant Society
P.O. Box 16257
St. Paul, MN 55116

Please notice a new P.O. Box address effective immediately.

Membership categories are:
- Individual or family $15
- Student or senior $8
- Institution $20
- Donor $25
- Lifetime $300

The monthly meetings serve as a great opportunity to expose a friend to our organization and this also presents a chance to meet up with other folks that have a strong passion for Minnesota's native flora.

Monthly Programs – Fall 2017 - Spring 2018

October 5: Minnesota Biological Survey (MBS) – highlights from the past 30 years and priorities for the future: Bruce Carlson, MBS Program Supervisor.

POM: Green violet (*Hybanthus concolor*) by Hannah Texler, MBS Plant Survey Supervisor.

November 2: Crow-Hassan Prairie – Fifty Years and Counting: John Moriarty, Senior Manager of Wildlife, Three Rivers Park District.

POM: Prairie violet (*Viola palmata*) by Angela Isackson, Wildlife Technician, Three Rivers Park.

December 7: Natural History and Restoration Ecology of Anoka Sand Plain Peatlands: Jason Husveth, Principal Ecologist, Critical Connections Ecological Services.

POM: A rare species of bristle-berry (*Rubus stipulatus*) by Jason Husveth.

February 1: Dean Lakes Conservation Area Restoration Project: Speaker TBA

March 1: MBS Long-term Ecological Monitoring Network in Minnesota: by Hannah Texler and Erika Rowe, Minnesota Department of Natural Resources.

April 5: Rusty Patched Bumble Bee: Elaine Evans, University of Minnesota – Bee Lab.

Society Leadership

Board members' names are followed with the year their term expires in parentheses.

President: Scott Milburn (2018)

Vice President: Welby Smith (2019)

Secretary: Mike Lynch (2020)

Treasurer/Membership: Ken Arndt (2019)

Board Member: John Arthur (2018)

Board Member: Simba Blood (2019)

Board Member: Tom Casey (2020)

Board Member: Steve Eggers (2018)

Board Member: Otto Gockman (2020)

Conservation Chair: Tom Casey

Field Trip Coordinator: Mike Lynch

Program Chair: Jyneen Thatcher

Publications Chair: Open

Symposium Chair: Otto Gockman

Website: Katy Chayka

Technical or Membership Inquiries: contact@mnnps.org

MNNPS Board of Directors

The board held officer elections at the summer board meeting. Of note is that Ron and Cathy Huber stepped down after twelve years at the helm. We are fortunate to have had their help, dedication, and commitment all of these years. Ken Arndt was elected by the board as our new treasurer and he will also coordinate efforts pertaining to membership. Mike Lynch, Scott Milburn, and Welby Smith were all re-elected to their positions.

MNNPS is a Volunteer Organization

You do not need to be a member of the board to contribute your time and skills. We always need field trip ideas and leaders as well as hospitality and logistics at monthly meetings. Ideas for monthly speakers are always welcome. At this time we are seeking a newsletter editor. We are preferably looking for someone who can write content in line with our mission as well as seek out writings from our membership. As you are aware, the newsletter is an integral part of the Society, serving to not only inform our membership about the goings-on of the Society, but also to educate the membership.

Summary of the Flora of Wisconsin's Interstate State Park Presentation

Derek Anderson

Wisconsin's Interstate State Park was formed in 1900, and is the oldest state park in Wisconsin. The roughly 1,300 acre park is located along the St. Croix River on the south side of St. Croix Falls, about 45 miles northeast of the Twin Cities metro area. Minnesota's Interstate Park is located on the south side of Taylors Falls. While it is smaller at 280 acres, it shares many species with the Wisconsin park. Over the course of three years, I visited the park throughout the growing season to document the flora of the park.

Interstate State Park has had a long history of botanizing, but until my survey, there had not been any exhaustive documentation of the flora. Richard Pohl conducted one of the more intensive surveys of the Park in 1936. Other noteworthy collecting trips were made by Norman Fassett in 1927 and 1934, Jacqueline Patman in 1959, and Theodore Cochrane in 1972.

Geologic events of the past shaped many of the native plant communities observed within the park today. These events include ancient lava flows, a vast inland sea, and most recently, the glaciers of the last ice age. The Park is primarily forested, and the most common forest types are mesic forest, dry-mesic forest, floodplain forest, and oak woodlands.

When we look at early public land survey records, we find that the tree composition in the area of the Park in the mid-1800s was similar to that of today. Surveyors characterized the Park as being "very broken," and "abounds with traprock [basalt]". The trees they noted in their notes included linden, birch, white oak, elm, hickory, pine, and butternut (presumably *Tilia americana, Betula* sp., *Quercus alba* and/or *Q. macrocarpa, Ulmus* sp., *Carya cordiformis, Pinus strobus*, and *Juglans cinerea*, respectively). Interestingly, the notes that describe section 36 in Township 34N, Range 19W mention prairie, which is consistent with the extensive bedrock glade community seen in the vicinity today (dominated by prairie grasses).

The section line notes for the area near the St. Croix

River indicate the presence of such species as white maple, black ash, willow, elm, and linden (presumably *Acer saccharinum, Fraxinus nigra, Salix* sp., *Ulmus* sp., and *Tilia americana*, respectively), which confirms the wetter nature of this area. The notes also reveal that in upland areas beyond the basalt exposures, mesic forest became common, including sugar maple, linden, white walnut, white ash, pine, elm, and oak (presumed to be *Acer saccharum, Tilia americana, Juglans cinerea, Fraxinus americana, Pinus strobus, Ulmus* sp., and *Quercus rubra*, respectively).

Findings

A total of 652 vascular plant taxa representing 366 genera and 118 families have been documented from the Park (I identified 612 of these species during the course of my surveys). The ferns and fern allies were represented by 35 taxa, gymnosperms by 9 taxa, and angiosperms by 608 taxa. Of the angiosperms, 184 taxa were monocots and 424 were dicots. The predominant plant families were the aster family with 68 taxa, the grass family with 67 taxa, the sedge family with 57 taxa, and the rose family with 33 taxa. These totals include two rare species listed as Threatened (kitten tails and brittle prickly pear cactus) and five species listed as Special Concern (Back's sedge, Laurentian bladder fern, fragrant fern, ginseng, and prairie fame flower) by the Wisconsin Department of Natural Resources, Bureau of Endangered Resources. In addition, three of the species were previously tracked by the Bureau of Endangered Resources, but were removed from the state's endangered species list during the course of the survey. These are *Carex assiniboinensis, Juglans cinerea*, and *Taxus canadensis*.

Ninety-four of the species are introduced, some of which are ecologically invasive. When comparing the species we collected with species previously documented by collections in the State's herbaria (UWSP, WIS), we identified 59 species not previously reported from Polk County. These include 25 species that are introduced and naturalized in the state of Wisconsin.

St. Croix River gorge – Photo by Derek Anderson

Plant Communities

Southern Mesic Forest, together with southern dry-mesic forest, comprises the majority of the acreage of the Park. These two communities grade into one another with changes in topography, slope aspect, and soil composition. The southern mesic forest is most commonly encountered in the eastern half of the Park. It is found on gentle to steep slopes, and there is little or no influence from the underlying bedrock on its composition. The southern mesic forests within the Park are dominated by sugar maple. Occasionally red oak, basswood, bitternut hickory, white ash, and green ash are canopy co-dominants. The understory is dominated by sugar maple and ironwood. The ground layer is diverse and consists of trilliums, hepaticas, Virginia waterleaf, maidenhair fern, lady fern, and many other spring ephemerals.

A well-developed **Floodplain Forest** can be seen along the St. Croix River. The forest is dominated by silver maple with lesser amounts of cottonwood, hackberry, box elder, and occasionally elm. Ground layer forbs include violets, wood nettle, ostrich fern, cut leaved coneflower, and cardinal flower.

Forested Seeps and **Wet/Mesic Forests** are found throughout the park, most commonly along the steep slopes above the river. These areas are usually dominated by black ash, American elm, and yellow birch. Occasionally sugar maple and basswood are found on the slightly more elevated areas. Where groundwater springs and seeps are present, skunk cabbage is abundant. Orange jewel-weed, water pennywort, marsh bluegrass, and swamp saxifrage are also common.

Cliffs are found in several area of the park. West- and south-facing cliffs tend to be dry, while north- and east- facing slopes tend to be wet. Some of these cliffs also have seeps that keep them wetter and allow them to support mosses and other plants. The cliffs are composed of both basalt and sandstone rock. These habitat supports a diversity of ferns (rusty woodsia, fragile fern, polypody fern). Commonly seen forbs include columbine, harebells, and corydalis.

Northern Dry-Mesic Forests occupy a fairly small portion of the overall acreage of the Park. It is associated with draws and ravines of the basalt cliffs along the St. Croix River. The canopy is dominated by white pine and occasional red pine, red oak, and northern pin oak. The shrub layer contains blueberries, while the ground layer contains abundant Canada may-flower, wild sarsaparilla, bunchberry, and star flower.

Oak woodlands are usually found between bedrock glades and the oak forests. Bedrock is usually close to the surface, with drier soils. Sometimes broken rock is scattered throughout. Several oak species (hills, white, and bur) are common. Sumac and hazel are found in the shrub layer. The ground layer is commonly composed of bottlebrush grass, northern bedstraw, big leaf aster, and various prairie species including prairie phlox, northern bedstraw, and kitten tails.

Bedrock glades are found where bedrock is at or near the surface (basalt rock here at the park). Dry, shallow soils support unique assemblages of plants adapted to these xeric conditions. Lichens, moss, and spike moss are common. Where there has been some soil accumulation, prairie/savanna/barrens species are observed. This includes a number of prairie grasses and forbs. Additionally, two rare species, brittle prickly pear and prairie fame flower are also found in this habitat.

Conclusions

The forest flora at the Park is the result of about 100 years of secondary successional regeneration of forest in northwestern Wisconsin. The diverse flora of the site is also influenced by several factors including things like bedrock, topography, and groundwater seepage. Nearly 25% of the state's flora can be observed within the boundaries of this one park. 163 species were documented in the Park for the first time and, of those, 59 were newly documented in the county. It becomes evident from these numbers that gaps still remain in our knowledge of plant distributions

within the state, particularly in those regions located the farthest from the state's universities. This situation has been observed throughout North America. Even with the many new discoveries, 40 taxa previously collected from the Park were not relocated during this three-year study. These species may actually no longer be found in the Park, or they may have been simply overlooked.

The diverse landscape of the Park supports several rare species. Kitten tails were rediscovered during the course of the survey. An older collection of the species was made in 1959. However, it did not include a specific location in the Park. As a result, it is uncertain whether the new record is from the same population as the older collection. Another species of particular interest is fragrant fern. It was first collected at the "Falls of St. Croix" by Charles Parry in 1848. According to correspondence between Parry and Dr. John Torrey, this was the first time the species was documented within the limits of the United States. Parry (1852) indicated that the plant was "quite abundant." This species now appears to be quite rare in the Park. Between 2011 and 2013, only a few small populations were discovered on the extensive cliffs.

The documentation of the flora at Interstate State Park sets the stage for future research and management activities at the Park. Follow-up activities could include: 1) monitoring and removal of invasive plant populations; 2) monitoring rare plant populations; 3) monitoring impacts of the white-tailed deer population on plant species and communities; 4) assessing comparisons of phenological shifts in certain species over time; and 5) using the results of this study as a baseline for future floristic work in the Park and the surrounding area.

***Lobelia cardinalis* – Photo by Derek Anderson**

Bladderworts of Minnesota (update)

Welby Smith

Bladderworts (genus *Utricularia*) are aquatic plants in the family Lentibulariaceae. There are more than 200 species of bladderworts and they occur nearly worldwide. Their popular appeal comes from the nature of the "bladders" that are attached to the leaves. They are tiny sacs with an opening at one end guarded by trigger hairs. When a small aquatic animal touches one of the trigger hairs, the bladder rapidly expands and sucks in the prey. So, they aren't simply bladders, they're traps designed to capture and digest small invertebrates. Each plant will have dozens or hundreds of such traps, qualifying them as important predators of aquatic animals.

In the spring 1988 newsletter of the Plant Press (vol. 7:3). I reported the discovery of a bladderwort that was new to Minnesota – *Utricularia resupinata*. It was found by Chel Anderson in Makwa Lake in the BWCAW. That brought the number of native bladderworts in Minnesota to six. Well, interesting things have happened in the world of bladderworts since then. Two additional species have been found in Minnesota, bringing the total to eight.

In 1992, Karen Myhre found *Utricularia purpurea* (the aptly named purple flowered bladderwort) in Cass County, it was the first time in Minnesota. Since then it has been found in lakes in Cass, Aitkin, Pine and Crow Wing counties. The plant produces rather conspicuous purple flowers that rise a few inches above the surface of the water. So, why hadn't it been found earlier than 1992? First, it is actually quite rare in Minnesota, and is now listed as endangered in the state. Secondly, the conspicuous purple flowers are not often produced. With no flowers, the plants won't be noticed unless a person is in a boat on a lake looking directly down into the water. Then what you see is a long slender stem with whorls of lacey leaves. We don't know for sure, but apparently the flowering pattern for this species is "boom or bust". This led to an interesting situation in a small lake in Cass County. In 2010 a lakeshore owner alerted the DNR that a strange purple-flowered plant had invaded the lake. When DNR botanists investigated,

they found a large and healthy population of *U. purpurea*, with just about every plant in flower. In all likelihood, the plants had been there all along, but never flowered before, or flowered at such low densities they weren't noticed.

In 2004, *Utricularia geminiscapa* (hidden-fruit bladderwort, another apt name) was found by Perry Scott in a wetland adjacent to Bald Eagle Creek in Lake County, another first for Minnesota. It has since been found in St. Louis, Becker, Itasca, Cass, and Chisago counties. Unlike *U. purpurea*, *U. geminiscapa* doesn't occur in lakes. It's found in shallow pools in fens and bogs, but like all *Utricularia*, it is carnivorous. The common name (hidden-fruit) tells you how to identify the plant, but it requires a bit of explanation. All species of *Utricularia* (that I know of) produce flowers that are held above the water to attract insect pollinators. Hidden-fruit bladderwort does that too, but it also does something quite different. It produces flowers that grow downward, into the water. They are never visited by insects, in fact they self-pollinate without ever opening. This type of flower is called cleistogamous. A cleistogamous flower may produce fruit, but it is "hidden" at the end of a short stalk on the underside of the plant, usually in the axil of a branch. You have to know what to look for in order to find it. And this plant won't be found easily, it is very rare in Minnesota and is officially listed as threatened.

***Utricularia purpurea* – Photo by Donna Perleberg**

Utricularia resupinata

See Bladderwort Key on Page 9

The Local History and Science behind Eastern Hemlock, Minnesota's Most Endangered Conifer

Emily Ellingson, University of Minnesota

Eastern hemlock (*Tsuga canadensis* (L). Carrière) is a slow-growing and long-lived conifer in the Pinaceae family. Of the four species in the genus *Tsuga* native to North America, *T. canadensis* is the most prolific and widely cultivated with over 270 cultivars of weeping, dwarf, and variegated varieties recorded. Historically, hemlock were used as a source of tannins in the tanning industry and as a timber species for making telephone poles, railroad ties, and paper pulp.

Eastern hemlock's range extends from Nova Scotia west into Wisconsin and Minnesota and south into Georgia and Alabama, with a number of disjunct populations in Indiana and Ohio. It grows in moist, temperate climates (Zone 3-7), often on north-facing slopes and in protected valleys or on rock ledges. Eastern hemlock can be distinguished from other conifers by its deeply furrowed bark, drooping and pendulous branches, and a "nodding" top. Their foliage is finely textured and individual needles are small, flat, and twisted around the stalk. They have small, wind-pollinated

cones that ripen in October and gravity and wind dispersed seeds.

Eastern hemlock is a late-successional climax species in forests across its range. They are considered a foundation species, which means their specific ecology and life-history traits define forest structure and ecosystem function. For example, eastern hemlock regulates soil chemistry and moisture and provide shelter for a variety of wildlife, ranging from birds to arboreal spiders. They are also incredibly shade tolerant and long-lived.

About 5,000 years ago, eastern hemlock experienced a range-wide decrease in populations in response to pests, pathogens, and/or a changing climate. Eastern hemlock is once again facing a decline due to the presence of an invasive pest from Asia, the hemlock woolly adelgid. This aphid-like insect is destroying populations in the eastern United States and has even been found in Michigan, where recent reports indicate that it is unlikely to be eradicated. Additionally, eastern hemlock is now considered "near threatened" by the International Union on the Conservation of Nature, due to a decreasing population trend.

Eastern hemlock has existed in Minnesota in smaller disjunct populations for at least 1,200 years, but is now listed as an endangered species. The number of trees has decreased significantly due to logging, fire, herbivorous predation, and poor recruitment. Where there were once over 5,000 eastern hemlock in the state in the early 1900's, there are now likely *less than 40* sexually mature trees with scattered saplings and seedlings of known native provenance. There are additional trees of various provenance in cultivation across the state in public gardens, state and municipal parks, and on private property.

Native Minnesotan eastern hemlock occur most often in St. Louis and Carlton counties. Trees are found along creeks and on moist, generally north-facing slopes, often with white cedar (*Thuja occidentalis*), yellow birch (*Betula alleghaniensis*), white pine (*Pinus strobus*), and balsam fir (*Abies balsamea*). At least one site has regeneration, partly due to the deer exclosures that the Minnesota Department of Natural Resources put in place. Generally, these sites are under threat from White-tailed deer predation and extreme weather events, such as floods, droughts, and fires.

The cultivated eastern hemlock in Minnesota have a range of provenance stories. The Minnesota Landscape Arboretum in Chanhassen contains several trees that are recorded as being derived from seeds collected from an extirpated population at Mille Lacs Lake, Minnesota. Additionally, there are a large number of trees of unknown, but possibly native origin across Minnesota. Notably, Jay Cooke State Park near Hemlock Ravine SNA, has one native tree and two trees of unknown origin. McCarthy Beach State Park near Hibbing contains a number of trees that were planted in 1935, possibly by the Civilian Conservation Corps. Theodore Wirth Park and the Eloise Butler Wildflower Garden in Minneapolis also contain a large number of trees, many of which were received and planted in the early 1900s. Additionally, Glensheen Mansion in Duluth, a nationally registered Historic Place, has several trees in cultivated and uncultivated areas of the garden that were recorded as being planted in 1907. Our studies at the University of Minnesota seek to address the variation in seed and vegetative propagation efficiency, the genetic diversity in Minnesota native, putatively native, and cultivated trees and seedlings, and the likelihood that reproductive age trees growing in Minnesota are of native origin. Additionally, by comparing eastern hemlock trees in Minnesota to those that occur within the main range and center of species diversity, we can further understand population structure.

Our ultimate goal with this research is to develop a set of recommendations for land managers in regards to the management and restoration potential of eastern hemlock. It is our hope that this information will be used to further the reproduction and distribution of eastern hemlock in Minnesota through sound nursery practices. This research could not be done without the collaboration of state, municipal, and private entities and we are thankful for their support and interest in this project.

This information was originally presented by Emily Ellingson during one of our monthly programs last year.

President's Column

Scott Milburn

I appreciate everyone's patience regarding the delayed newsletter. It has been a few years since Gerry Drewry stepped down as editor of the Plant Press, and it has been quite difficult to replace her. We are currently looking for someone who would enjoy the responsibility and the challenge. The newsletter had served as a primary mechanism for communicating with the membership along with postcard mailings and notifications in local newspapers. We now rely on email, internet, and social media platforms to communicate. However, it is crucial that we hold onto certain traditions while embracing the new. Not only are we looking for an editor, but we are looking for contributions from the membership with articles that are in line with our mission. Our goal is to produce a high-quality newsletter that educates, informs, and entertains. If you have interests in helping out from written content to the overall layout, I ask that you contact me directly.

To change the subject, I would like to go into a discussion that our organization has typically shied away from in the printed form. We are in a highly charged political time, and it seems constant. Much of that is how we now communicate and the immediate access to information. But another factor is that we have an unorthodox and colorful president who has yet to show any interest in conservation. He is not alone and it seems that natural resources take a back seat to a myriad of reasons and excuses. The chief argument by opponents against environmental protection is often the claim that the jobs will be affected or that the costs will be too great. However, these pretenses should be challenged under the notion that there is an economic advantage directly related to protection.

A good case in point is our very own Buffer Law. There has been much resistance to the law due to perceived government overreach and the potential for lost revenue in the private sector. Buffers around waterways and ditches appear to be a solid best management practice in the hypothetical. There is no argument that our waters have been impacted by agriculture, an industry that we are reliant upon. Farming is a difficult business, and we must empathize and support those who opt to choose this path for their livelihood. However, agriculture is highly subsidized in various ways from the federal to the state level. On the state level, tax-paying citizens are having to pay in one way or another for the pollution of water, and basically subsidizing those who implement poor management practices. There is opportunity to provide for real solutions that not only protect those in agriculture, but protect everyone. I don't hold the view of Ronald Reagan and his well-known adage that government is the problem and not the solution. Yet, the current political landscape is filled with inept individuals. We need contentious and altruistic types in political positions rather than the current class.

On the other end of the spectrum are taxing bodies like county entities. These county governments are centered on increasing their tax base, and they seem to need continual growth in order to sustain themselves. Certain counties are directly opposed to the addition of public lands with one reason being the loss of potential tax revenue. This approach makes it extremely difficult to acquire and protect those remaining natural areas that are under private ownership. The conversion of these lands to public ownership should not be seen as a detriment, but as a means of protecting resources for future generations. We have the ability to enjoy many natural areas which include a rich flora and fauna, but we also need to ensure this in perpetuity and to not relegate these experiences to only botanical gardens and zoos. One solution to reduce the pressure on these counties is to consolidate counties into larger units. Such maneuvering would allow for the sharing of resources like equipment and staff. With that, less tax revenue would be needed perhaps, and thus reduce the opposition against additional acquisition of public lands. Minnesota is such a marvelous state with much to see and explore, and we need to look beyond the now. My column is not intended to offend anyone and serves as an opinion piece. With that, hopefully this provokes thought, discussion, and perhaps change.

The 1988 newsletter contained a key to the identification of the six species of *Utricularia* known from Minnesota at the time. The following key incorporates the two new species:

1. Flowers some shade of purple or blue.

    2. Plants free-floating in the water; leaves whorled and bladders formed at leaf tips ___ *U. purpurea.*

    2. Plants rooted in the substrate _____ *U. resupinata.*

1. Flowers yellow.

    3. Plants aquatic, free-floating limply in open water; each leaf divided into 2 or more segments.

        4. Leaf segments flat, each with a visible midvein; bladders borne on separate leafless branches _____ *U. intermedia.*

        4. Leaf segments generally round in cross-section (terete); bladders borne on the leaves, all branches of the stem essentially alike.

            5. Stems with cleistogamous flowers (appearing as a small spherical structure at the end of a short, stout, curved peduncle on the "underside" of the stem, usually at a branch of the stem), regular petal-producing flowers present or not _____ *U. geminiscapa.*

            5. Stems lacking cleistogamous flowers, all flowers with distinct petals rising above the surface of the water, or flowers lacking).

                6. Plants coarse, the stems long and at least 0.4 mm wide; leaves 1.5-7 cm long, divided into numerous segments _____ *U. macrorhiza* (*U. vulgaris*).

                6. Plants delicate, the stems short and less than 0.3 mm wide; leaves 0.2-1 cm long, divided into 2--4 segments.

                    7. Leaves divided once near the base, resulting in 2 unbranched segments ___ *U. gibba.*

                    7. Leaves divided once near the base, with each resulting segment branching into 2 additional segments _____ *U. minor.*

    3. Plants terrestrial, rooted in wet sand, peat or mud; leaves undivided, usually covered by sediments and not visible, or only the tips visible _____ *U. cornuta.*

Utricularia cornuta

Utricularia minor

Minnesota Native Plant Society
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SUMMER-FALL 2017

Dakota Lodge, Thompson County Park
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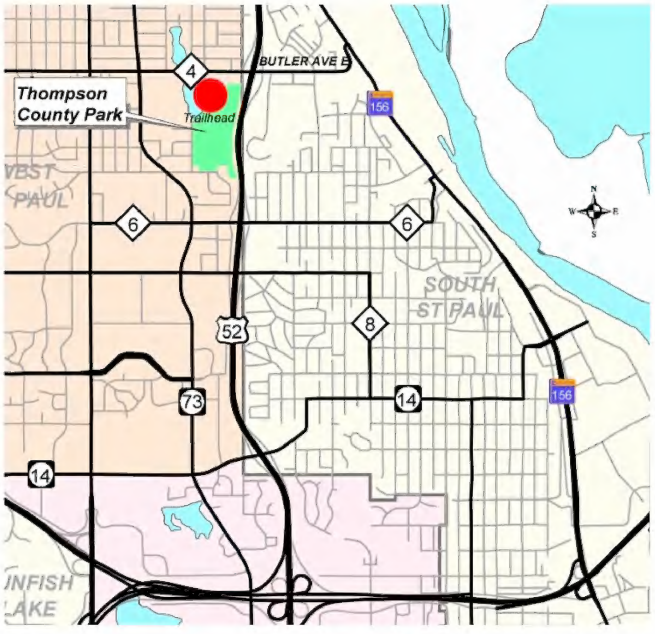

Directions:
Take Highway 52 to the Butler Ave. E. exit in West St. Paul.
Go west on Butler 0.2 mile to Stassen Lane.
Go south on Stassen Lane to the parking lot at the end of the road in Thompson County Park

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Monthly Programs – Spring 2018

February 1: Dean Lakes Conservation Area Restoration Project: Doug Mensing, Sr. Ecologist, Applied Ecological Services and Matt Lasch, Minnesota Contracting Manager, Applied Ecological Services.

POM: *Dalea villosa (*Silky prairie clover)

March 1: Minnesota Biological Survey Long-term Ecological Monitoring Network in Minnesota: by Hannah Texler, Plant Survey Supervisor, and Erika Rowe, Plant Ecologist/Botanist, - MN Department of Natural Resources.

POM: Mesic Prairie in Kertsonville WMA

April 5: Rusty Patched Bumble Bee: Elaine Evans, University of Minnesota – Bee Lab.

April 21: Annual Symposium - Old Growth Forests: Examining a Disappearing Landscape.

May 3: Jim Manolis, Forest Conservation Program Director, The Nature Conservancy: Collaborating for Resilience in the Face of Climate Change: TNC's Forest Conservation and Restoration Program.

POM: TNC's Upper Manitou Preserve

June 7: A world-class biogeographical oddity: the boreal forests of Door County by Lee E. Frelich

Director, The University of Minnesota Center for Forest Ecology.

POM: *Iris lacustris (*Dwarf lake iris)

Society Leadership

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You do not need to be a member of the board to contribute your time and skills. We always need field trip ideas and leaders as well as hospitality and logistics at monthly meetings. Ideas for monthly speakers are always welcome. At this time we are seeking a newsletter editor. We are preferably looking for someone who can write content in line with our mission as well as seek out writings from our membership. As you are aware, the newsletter is an integral part of the Society, serving to not only inform our membership about the goings-on of the Society, but also to educate the membership.

Many thanks for the contributors of this newsletter including John Thayer (*Lobaria* distribution maps), Mike Lee, Otto Gockman, Bruce Carlson, and Minnesota Wildflowers. We hope you enjoy this edition of the Minnesota Plant Press.

Minnesota Biological Survey: 30 years strong and beyond

Bruce Carlson, MBS Supervisor, Minnesota Department of Natural Resources

In 1987, with a handful of staff and start-up funding from The Nature Conservancy and Minnesota's Environment and Natural Resources Trust Fund (ENRTF), the Minnesota Biological Survey (MBS) was launched with a central goal that continues today: conduct a statewide, county-by-county baseline biological survey of Minnesota. Originally called the Minnesota County Biological Survey, it has been guided by a mission to collect and deliver data on native plants, animals, and plant communities to support the conservation and management of biodiversity.

MBS field biologists have climbed hills, roamed valleys, scrambled boulders and cliffs, forded water, flipped logs, and searched countless nooks and crannies to discover and describe Minnesota's natural heritage. The results are impressive: 84 of 87 counties have complete baseline field surveys for vascular plants, small mammals, birds, amphibians, and reptiles; nearly 25,000 rare species locations have been documented; over 50,000 plant specimens have been collected and prepared; over 90,000 plant communities have been mapped; over 10,000 sites of statewide biodiversity significance have been ranked and mapped; and a premier collection of staff have developed extraordinary expertise in Minnesota's native biological diversity.

Along the way, MBS has evolved to include other projects and responsibilities in addition to the statewide survey. Examples include long-term monitoring of state and federally-listed plant species; research into the response of native prairie vegetation to cattle grazing; baseline statewide surveys for aquatic plants, bees, and moths; and, more recently, the launching of a statewide ecological monitoring network to track long-term status and trends of native vegetation.

Today MBS finds itself facing major change. With only three counties remaining, MBS is targeting 2021 as the year that the original survey will be completed. What's next? Should the statewide survey end? Or should it start again, beginning with areas surveyed 30 years ago in order to update and enhance the initial effort? What's changed since the program started? Why are we relevant? What needs to change or improve? These are the questions at the fore as MBS charts its future.

To help answer these questions, MBS embarked on a strategic planning exercise. The program looked internally, talking with MBS staff about the program's strengths, weaknesses, opportunities, and challenges. Looking externally, a project team toured the state interviewing regional DNR staff and external partners about their needs for biological survey data, about emerging issues that are or will impact biological diversity, and how MBS might address them. The team reviewed state laws, rules, policies, and major natural resource and conservation initiatives to determine why a biological survey is necessary and why it should be given priority in the ever-increasing competition for limited public dollars.

We wrapped all of this up into a 10-year strategic plan with three overarching goals that speak to the needs, trends, and mandates we identified: 1) collect data and information needed to sustain, protect, and enhance Minnesota's biological diversity; 2) provide ongoing management and delivery of information to meet the needs of DNR and our conservation partners; and 3) exemplify operational excellence in our work. The plan will guide MBS over the next ten years in efforts to collect and deliver statewide biological data and address emerging biological diversity issues. It provides guidance for funding, staffing, partnerships, and integrating our work with other key programs within the DNR. It is intended to increase awareness of MBS and promote collaboration with others who work to manage and conserve Minnesota's biological diversity.

A few examples of MBS priorities over the coming decade include continuation of statewide surveys on bees, moths, and aquatic plants; targeted surveys to update MBS field data that is greater than 20-years-old; surveys for under-sampled taxa such as mosses, lichens, and insect pollinators such as beetles and flies; added attention to monitoring of the long-term status and trends of native biodiversity and also shorter-term monitoring on how biodiversity responds to land and water management actions; and research and analysis of the relationships among biodiversity and climate change, watershed health, and pollination. The complete MBS strategic plan will soon be available on the MBS website (www.dnr.state.mn.us/mbs).

2018 will mark the 31st field season for MBS. The statewide baseline biological survey will soon be realized. The program has grown from a handful of staff and a small start-up budget in 1987 to 30 staff and an annual budget of $3.5 million today. Financial support from the ENRTF has been consistent the entire time (with variably other state and federal funding). This strategic plan sets us on a guided course to our future and confirms what many of us have known all along: that MBS, and more broadly, basic biological survey, has been, is, and will continue to be relevant and necessary to the people of Minnesota.

Rare Plant Monitoring News

Michael D. Lee , MBS Plant Ecologist/Botanist

The Minnesota Biological Survey (MBS) is becoming increasingly focused on monitoring rare plant species in Minnesota. Dating back to the days of the Natural Heritage Program, DNR botanists have been conducting long-term monitoring studies on select species for several decades (*Platanthera praeclara*, *Erythronium propullans*, and *Lespedeza leptostachya* since the early-1980's, and *Rhodiola integrifolia* ssp. *leedyi* since the mid-1990's). These species were priorities for monitoring due in large part to their inclusion on the Federal Endangered Species list.

More recently, MBS botanists have begun to expand their monitoring focus to include other rare plants, most of these on the State's Endangered Species List. In response to a requirement of the High Conservation Value Forest principle under DNR Forest Certification, intensive survey efforts the past five years or so have been concentrated in sites of Outstanding Biodiversity Significance in southeastern Minnesota in order to collect detailed data on the population abundance and extent of a suite of rare plants that occur in little-disturbed mesic forests and dry bluff prairies and savannas. This work is intended to serve as a baseline for recurring visits to sites such as Whitewater South Fork, Shattuck Creek (**Figure 1**), Diamond Creek, West Indian Creek, Rushford Sand Barrens, Whitewater Sand Savannas, Whitewater State Park, and Money Creek Woods to assess how rare plant populations are being affected by forest management, exotic species invasion, and other factors.

At Quarry Park Scientific & Natural Area (SNA) on the outskirts of St. Cloud, a new effort to monitor *Platanthera flava* (**Figure 2**) was begun in 2017. This monitoring effort attempts to serve two goals: 1) effectiveness monitoring to assess how the state's largest *P. flava* population responds to restorative

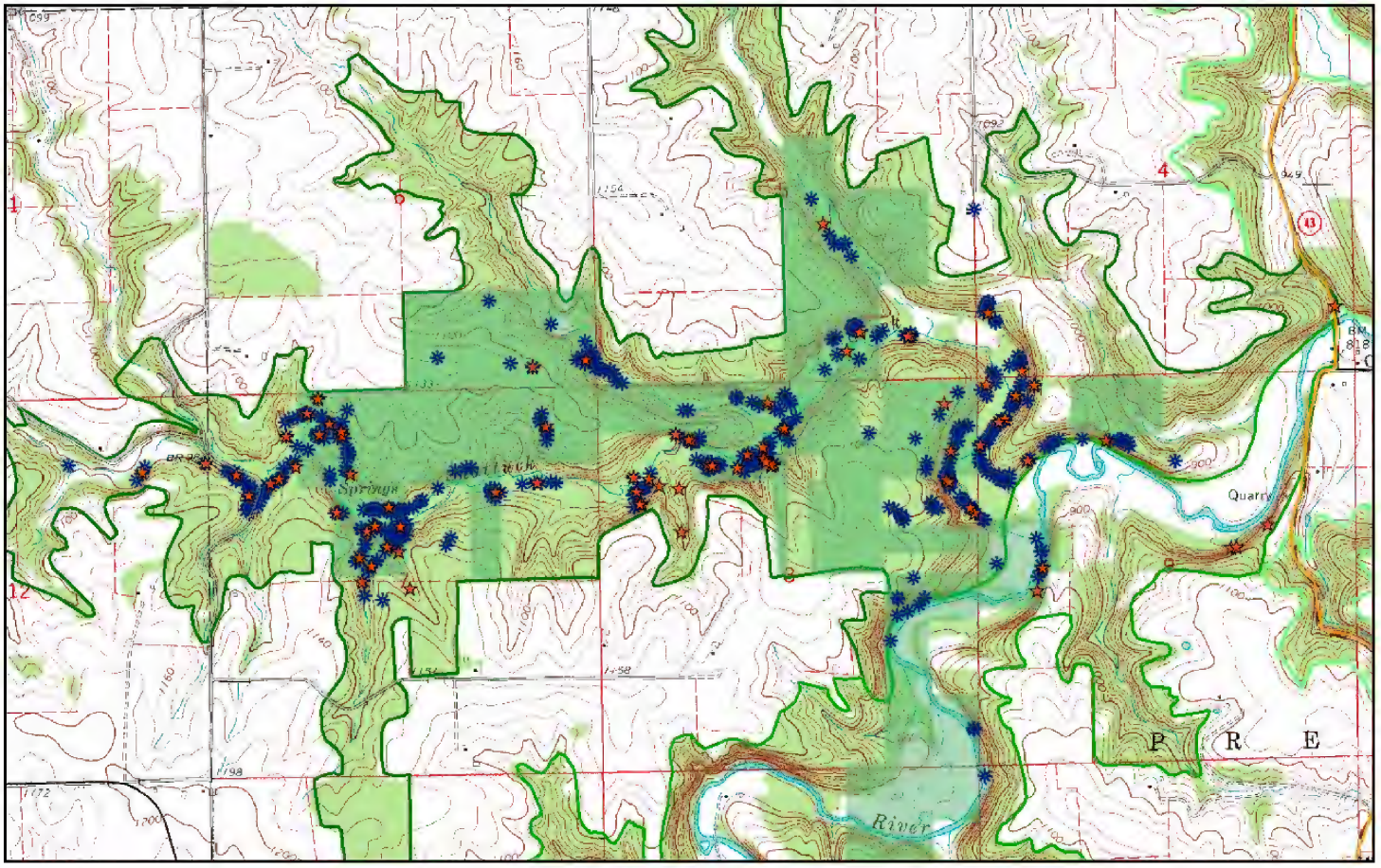


Figure 1. Shattuck Creek with monitoring plot locations - Fillmore County, Minnesota

Figure 2. *Platanthera flava* – Photo from Quarry Park SNA

management actions including buckthorn and other woody species removal, and 2) assessing long-term population trends. Ten plots were established on the SNA and two additional plots were established on populations in nearby St. Cloud. Each plot consists of a 50 meter belt transect 5 meters wide that runs along the ecotone between sedge meadow and oak woodland; this moist but not too wet zone being the preferred habitat for this orchid in this part of its range. In the absence of fire, much of this ecotone has been overgrown with buckthorn and other woody species to the detriment of *P. flava* and other native wet prairie species. SNA management staff, in conjunction with Stearns County Park staff, plan to remove the brush in several of the plots. Prescribed fire will be used in some of those same plots and in some others where no woody cutting takes place. The monitoring of these managed plots and the unmanaged control plots will help to assess the effects of each of these managementprescriptions on the orchids and their sedge meadow margin habitat.

Other species currently receiving monitoring attention by MBS staff include *Aureolaria pedicularia*, *Cypripedium candidum*, *C. arietinum*, and *Polemonium occidentale* ssp. *lacustre*. In conjunction with the ongoing update of the Rare Species Guide, and periodic

review of the State's Endangered Species list, a review of all state-listed plants is planned to help prioritize which ones might see monitoring efforts in the near future.

Lobaria species in Minnesota

Otto Gockman, MNNPS Board Member

Lichens do not stand out to most people and are often subconsciously treated as extensions of the substrate on which they grow. As examples, think of the bright orange color of the crustose lichen *Xanthoria elegans* along the North Shore of Lake Superior or the various species of *Usnea* (old man's beard) that can cover conifers (particularly dead balsam fir and black spruce) in the northern portions of the state or the abundance of *Cladonia* (cup lichen) and *Cladina* (reindeer lichen) species that cover many northern rock outcrops. To the casual observer, these species are just colored rocks or parts of a tree, but if one stops to examine them closer, they will find a remarkable assemblage of highly diverse organisms. The genus *Lobaria* tends to be an exception to this. It is rarely seen and ignored, it is often confused with vascular plants, and those that find them are typically in an interesting place and appreciate the uniqueness of the organism they see.

According to the most recent version of A Cumulative Checklist for the Lichen-forming, Lichenicolous and Allied Fungi of the Continental United States and Canada, by Theodore Esslinger (2016), there are fifteen species of *Lobaria* in North America. Most of these species are relatively large, charismatic, foliose (leaf-like) macrolichens. In Minnesota, we have these species, *L. pulmonaria*, *L. quercizans*, and *L. scrobiculata*. All of our *Lobaria* species tend to grow in stable, high-humidity, communities in close proximity to wetlands or bodies of water. *Lobaria quercizans* tends to be more tolerant of drier conditions, and can often be found in rich maple basswood forests. However all of the species, including *L. quercizans*, can be found on moist rocks and cliffs, or on various trees in wet forest and forested peatland communities.

Lobaria pulmonaria is probably the most charismatic and recognizable of our species (see **page 6** for images and distribution in Minnesota). As suggested by the specific epithet, this species has a lung-like appearance. With its broad lobes, covered in a network of ridges anddips, it is often recognized on sight. When *L. pulmonaria* is provided with humid, stable conditions, it can cover trunks of trees or large patches of exposed rock. These colonies can be very impressive and can stop someone in their tracks if they are lucky enough to spot one. The species occurs throughout the Laurentian Mixed Forest Province in Minnesota. There happen to be a number of historical records of it from the Wisconsin and Iowa portions of the Paleozoic Plateau, so there is potential for this species to occur in the southeastern corner of the state. Interestingly the lone Iowa collection was made by Bruce Fink, a well-known lichenologist who spent a number of years in Minnesota and wrote the first treatment of the state's lichens, *The Lichens of Minnesota* back in 1910.

Lobaria quercizans is arguably the least charismatic of the three species in the state (see **Page 7** for images and distribution in Minnesota). The lobes of this species often hug the substrate on which it occurs making it superficially look like a large species in the genus *Parmelia*. This species is also the only species of *Lobaria* in the state that regularly produces apothecia, which are fruiting bodies that are dark red-brown. The nondescript appearance of this species has likely led to it being overlooked and under-collected in the state for many years. As a result, this species was added to the state's rare species list and designated as threatened in 1984. The status of this species was dropped to Special Concern in 1996 due to an increase in collected specimens since the initial listing and it was eventually delisted in 2013. This species appears to be secure in Minnesota, but is still remains under-collected.

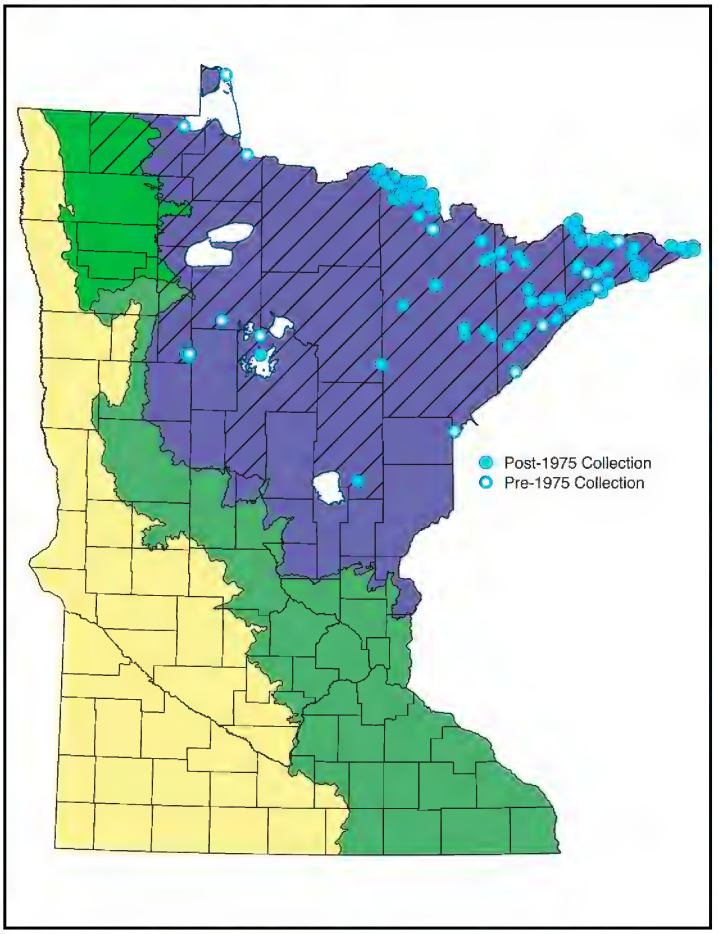
Lobaria scrobiculata is the only species in the genus which is currently listed by the DNR, with the status of threatened (see **Page 8** for images and distribution in Minnesota). In North America, this species is found primarily in coastal regions and at higher elevations. The main, though not the only, exception being a series of records of this species from the north shore of Lake Superior in Minnesota, Ontario, and on Isle Royale (Michigan). In Minnesota, *L. scrobiculata* appears to be extremely rare. The species has only been collected four times in the last 30 years and only four times prior to that. Typically *L. scrobiculata* occurs mixed with *L. pulmonaria* and a group of other old-growth preferring lichen species such as *Parmotrema* and *Cetrelia*.

Special thanks to Minnesota Wildflowers for the use of their camera equipment and digital editing of the for the close-up images of the three species of *Lobaria*.

Lobaria pulmonaria - **Field**

Lobaria pulmonaria - **Surface**

Lobaria pulmonaria - **Underside**

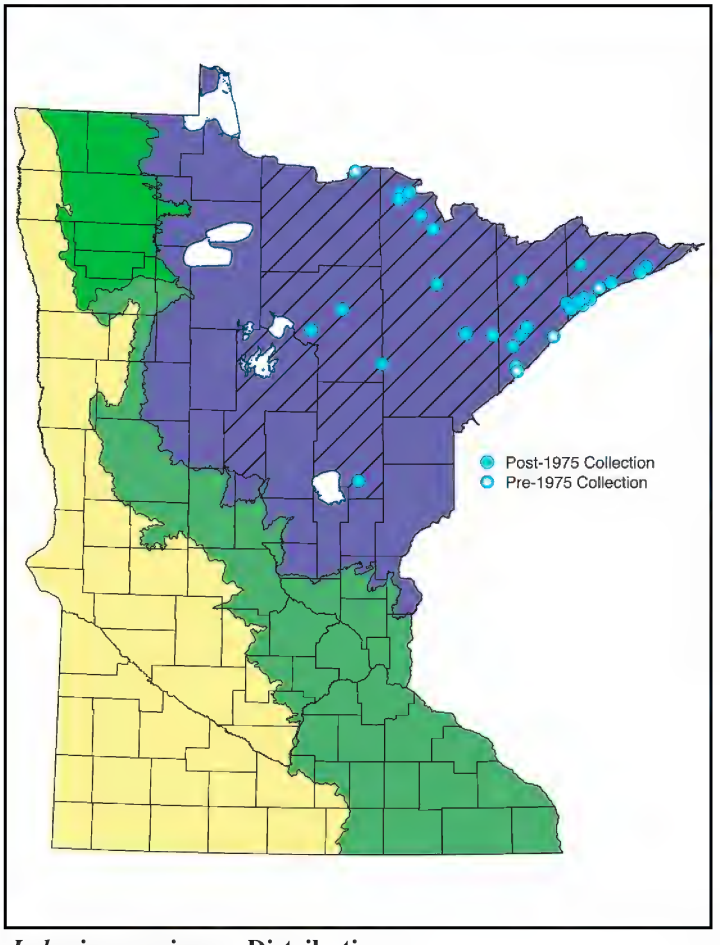


Lobaria pulmonaria - **Distribution**

Lobaria quercizans - **Field**

Lobaria quercizans - **Surface**

Lobaria quercizans - **Underside**

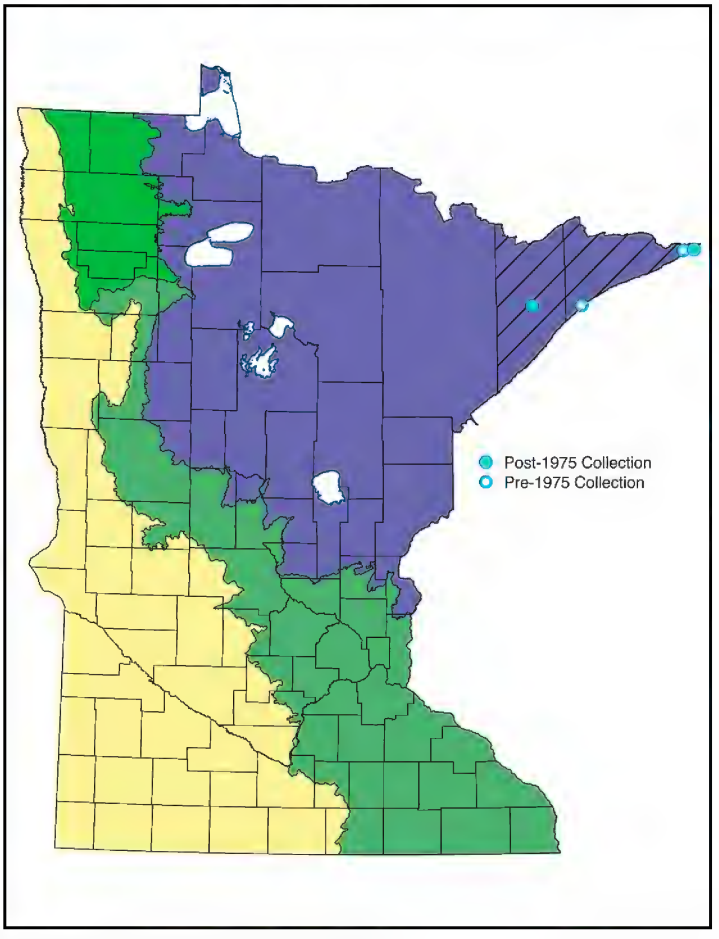


Lobaria quercizans - **Distribution**

Lobaria scrobiculata - **Field**

Lobaria scrobiculata - **Surface**

Lobaria scrobiculata - **Underside**



Lobaria scrobiculata - **Distribution**

Scientific and Natural Areas Profile - Mound Spring Prairie SNA

Scott Milburn, MNNPS President

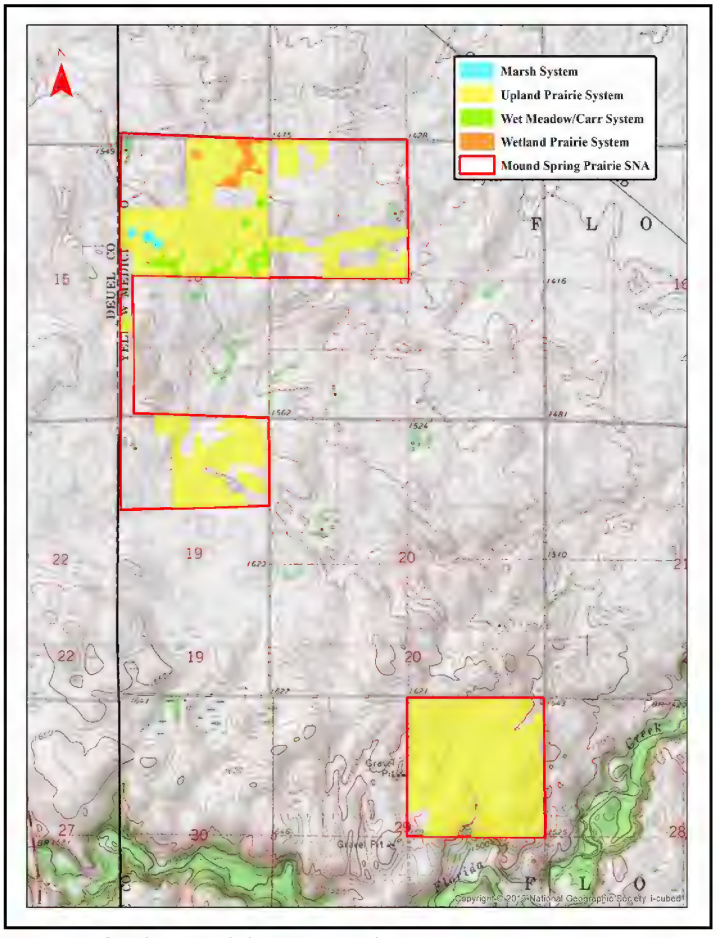
Directly bordering South Dakota, Mound Spring Prairie SNA is one of the largest remaining expanses of prairie remaining in the Coteau Moraines Subsection. The visual landscape is stunning with considerable topography, typical for much of Yellow Medicine County. The SNA is in two separate units, with the northern unit officially designated as an SNA in 2001 and the southern unit added in 2012. This SNA is mostly mapped as a site of biodiversity significance (high) due to the number of rare native plant communities and species.

Native plant communities present include the Dry Sand – Gravel Prairie (UPs13b), Dry Hill Prairie (UPs13d), Mesic Prairie (UPs23a), Seepage Meadow/Carr (WMs83a), Wet Prairie (WPs54b), and Calcareous Fen (OPp93b). The fens in this part of the state are referred to as domed fens.

Rare plant species documented at Mound Spring Prairie includes Missouri milk-vetch (*Astragalus missouriensis*), yellow-fruit sedge (*Carex annectens*), small white lady's slipper (*Cypripedium candidum*), western white prairie clover (*Dalea candida* var. *oligophylla*), and yellow prairie violet (*Viola nuttallii*).

The Missouri milk vetch is restricted to southwest Minnesota and is one of eleven *Astragalus* species in Minnesota. The species is found in dry prairie and is associated with the yellow prairie violet. As noted in the DNR's rare species guide, this species is similar to prairie milk-vetch (*A. adsurgens*) but can be differentiated from the latter based on the size of the stem in comparison to the leaves and flowers.

The small white lady's slipper is a rather iconic prairie species. It can be observed in the wet prairie components in the SNA. This species as noted in Welby Smith's *Native Orchids of Minnesota* book can hybridize with both varieties of the yellow lady's slipper (*C. parviflorum*) adding to the confusion in identifying specimens with only vegetative characteristics. Fortunately, the small white lady's slipper is the only *Cypripedium* species known in this region of the state. The DNR has an active monitoring program for this species which provides an excellent volunteering opportunity for those with an interest.



Mound Spring Prairie Boundaries

Green milkweed- *Asclepias viridiflora*

The yellow-fruit sedge is found in the southern third of the state and generally distributed in the eastern half of the United States. This species is found in open communities (wet meadow to prairie communities) with varying moisture regimes. Similar in appearance to the common fox sedge (*C. vulpinoidea*), but differs in that the flowering culm extends above the leaves in *Carex annectens*. Observation of such should bring one's attention to further examination of the individual, evaluating other diagnostic features.

The western white prairie-clover can also be seen at this SNA. It is was of two varieties in the state. One of the key diagnostic field traits that distinguishes this variety is the growth form. The stems on this variety are diffuse versus virgate. The purple prairie clover (*Dalea purpurea*) is also present at the SNA, but they are easy to distinguish from one another based on the leaf size.

The yellow prairie violet is only known from three counties in the state. This is one of our many stemless violets and one of two native yellow violet species in Minnesota, the other being *Viola pubescens.* Like *Astragalus missouriensis*, this species inhabits dry prairie systems having course substrate but does well with reduced vegetative cover. The leaf shape can be used to differentiate this species from other possible prairie violets, *V. peditifida* and *V. palmata.* The latter two species have palmate leaves where the yellow prairie violet has leaves that range from elliptic-lanceolate to ovate and are not lobed.

The calcareous fens in this part of the state are convex features associated with slopes. These fens also tend to have a different vegetative composition in comparison to fens of the Minnesota River valley or Glacial Lake Agassiz. Most of the state-listed calciphiles are absent with the exception of hair-like beak rush (*Rhynchospora capillacea*). This species has yet to be detected at the SNA, but a great example of a fen with this species is found three miles directly south. The fen, Fortier 6, is an extensive carpet of hair-like beak rush and unlike other regional fens in that sense.

The SNA is also host to a number of other rare species including Loggerhead Shrikes (*Lanius ludovicianus*), prairie vole (*Microtus ochrogaster*), and regal fritillary (*Speyeria idealia*). A BioBlitz is planned for the SNA on August 11, 2018, so perhaps more rare species will be discovered. Please contact Brad Bolduan, SNA Specialist (brad.bolduan@state.mn.us) with the DNR for more information.

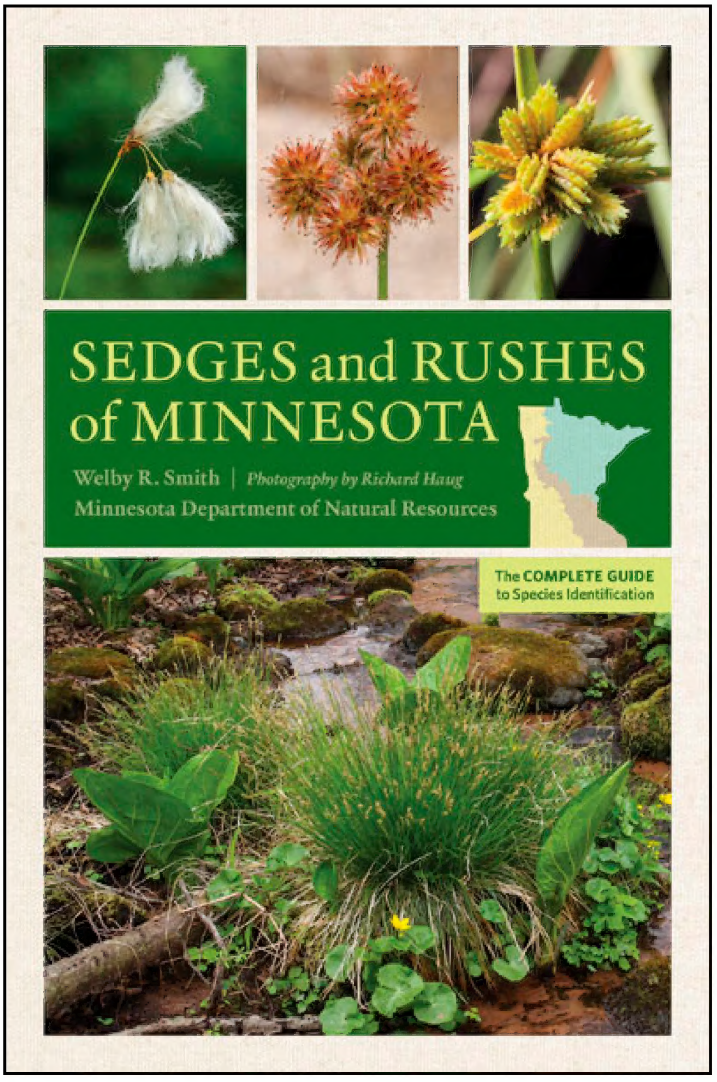
Prairie coneflower - *Ratibida columnifera*

Carolina delphinium - *Delphinium carolinianum*

Landscape image of Mound Spring Prairie SNA

Western white prairie clover - *Dalea candida var. oligophylla*

Purple prairie clover - *Dalea purpurea*


SEDGES and RUSHES
of MINNESOTA
Welby R. Smith | Photography by Richard Haug
Minnesota Department of Natural Resources
The COMPLETE GUIDE
to Species Identification

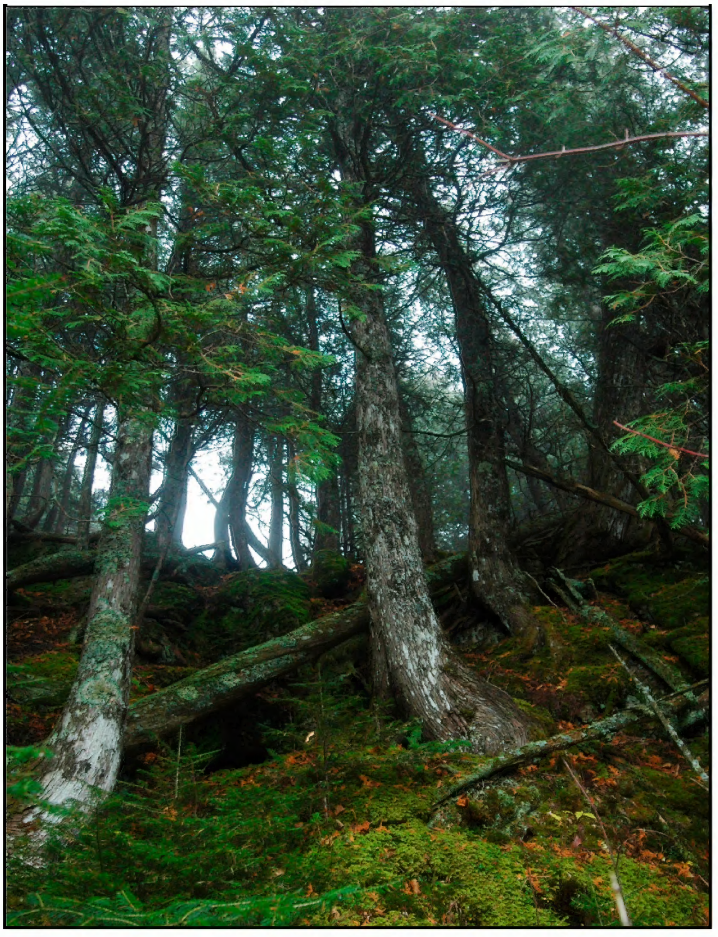
Society News

It is an exciting time for those who are interested in sedges and rushes. The Vice President of our Society and state botanist, Welby Smith, has a new book coming out this summer on *Sedges and Rushes of Minnesota*. The book is scheduled for release during the heart of sedge and rush season in July and will be available through the University of Minnesota Press. This is a must have resource for any plant enthusiast in the region. Users will be amazed by the detailed and useful content, including the stellar photographic work by Rick Haug. We will be hosting Welby at our October meeting where he will discuss the book.

In other news, the Board of Directors will be proposing an amendment to our Articles of Incorporation at the June monthly meeting. The Board is proposing to add the following sentence to Article IX: "Any action permitted to be taken at a meeting of the Board of Directors may be taken by written action, signed or consented to by electronic communication, by a simple majority of all Directors." If approved by a 2/3 vote of the members, this amendment gives our Board of Directors greater ability to make decisions between board meetings. Without an amendment to our Articles of Incorporation allowing a majority vote, Minnesota Statute 317A.239 requires a unanimous vote of all board members to make a decision between meetings, an onerous requirement for a volunteer board.

2018 Symposium

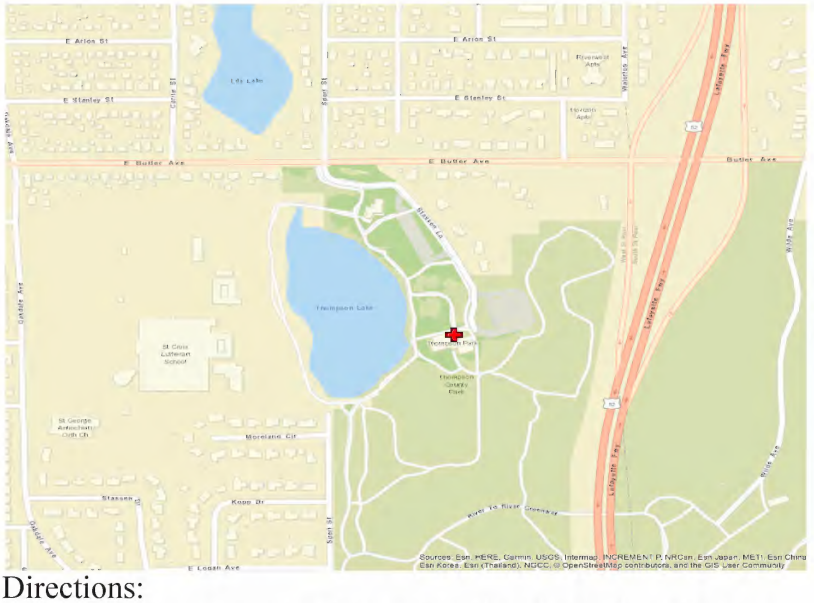
Registration is now open for our annual symposium. The event will be on Saturday, April 21, 2018 at the Minnesota Landscape Arboretum. Kind thanks to David Remucal and the Minnesota Landscape Arboretum for co-sponsoring the event. This year's topic will be on old growth forests. We will be taking a look at the ecology of these systems as well at several case studies with talks on the Porcupine Mountains and Sylvania Wilderness, and the Magney-Snively Natural Area. Other talks will include the fire dependent red pine dominated forests in the Boundary Waters and the use of lichens in assessing forest systems. The symposium brochure is available on our website. All questions can be directed to Shirley Mah Kooyman at smkooyman@gmail.com or 763-559-3114.



Minnesota Native Plant Society
P.O. Box 16237
St. Paul, MN 55116

Winter 2017-2018

Dakota Lodge, Thompson County Park
1200 Stassen Lane, West St. Paul, MN 55113


E Arlos St
E Stanley St
E Butler Ave
Lily Lake
Thompson Lake
Moreland Cir
Stassen Ln
Koon Dr
E Logan Ave
Butler Ave
Wentz Ave
Robert St
Lexington Pkwy
Dakota Ave
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Directions:
Take Highway 52 to the Butler Ave. E. exit in West St. Paul.
Go west on Butler 0.2 mile to Stassen Lane.
Go south on Stassen Lane to Thompson County Park.